



# State of Utah

DEPARTMENT OF NATURAL RESOURCES  
DIVISION OF OIL, GAS AND MINING

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December 1, 2000

TO: Internal File

THRU: Joe C. Helfrich, Team Lead *JCH*

FROM: James D. Smith, Reclamation Specialist *JDS*

RE: Technical Analysis of Significant Revision SR00B, Lodestar Energy, Inc.,  
Horizon Mine, C/007/020-SR00B

## SUMMARY

The proposed amendment, to add approximately 711 acres to the current permit area, was submitted by Lodestar Energy on August 21, 2000. This Significant Revision will extend the permit boundary for the Horizon No. 1 Mine into federal lease UTU-74804.

## TECHNICAL ANALYSIS

## ENVIRONMENTAL RESOURCE INFORMATION

## GEOLOGIC RESOURCE INFORMATION

### Analysis:

Other than a revised plate 6-1, no new or additional geologic information has been submitted with this significant revision. The current coal mining plan includes geologic information in sufficient detail to assist in determining: the probable hydrologic consequences of the operation upon the quality and quantity of surface and ground water in the permit and adjacent areas, including the extent to which surface- and ground-water monitoring is necessary; whether reclamation can be accomplished; whether the proposed operation has been designed to prevent material damage to the hydrologic balance outside the permit area; and preparing the subsidence control plan.

Chapter 6 of the current plan has a description of the geology of the proposed permit and adjacent areas down to and including the deeper of either the stratum immediately below the lowest coal seam to be mined or any aquifer below the lowest coal seam to be mined that may be adversely impacted by mining. This description includes the areal and structural geology of the permit and adjacent areas,

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and other parameters that influence the required reclamation, and it also shows how the areal and structural geology may affect the occurrence, availability, movement, quantity, and quality of potentially impacted surface and ground water. It is based on maps and plans required as resource information for the plan, detailed site specific information, and geologic literature and practices.

No new logs have been submitted with the significant revision. Logs of drill holes LMC-1, LMC-2, and LMC-3, drilled in 1976, and LMC-4, drilled in 1980, are in Appendix 6-1. These logs show lithologic characteristics, including physical properties and thickness of each stratum that may be impacted. There is no indication on these logs that ground water was encountered, and Joseph A. Harvey, a consultant who was present during the drilling, has stated that the holes were dry during drilling (Appendix 7-1). LMC-1, LMC-3, and LMC-4, plugged-back to different depths and in different lithologies, were monitored for ground water from 1992 to 1995 and were always dry. LMC-2 was plugged back to a depth of 50 feet and has always been dry also (MRP pp. 7-7 through 7-12).

Logs for water-level observation wells HZ-95-1, HZ-95-2, HZ-95-3, completed in the Spring Canyon Tongue of the Starpoint Sandstone, are in Appendix 7-5. The log for HZ-95-1S, completed in a perched aquifer within the Blackhawk Formation, is also in that appendix.

Additional information on lithologic characteristics for the permit and adjacent areas is shown on geologic cross sections on Plates 6-2 and 6-3 in the current MRP. Approximate locations of the bore-holes and measured sections used to make these cross sections are shown on small index maps and tabulated in Tables 6-3 and 6-4. The relationship of these cross sections to the proposed revised permit area is not clear. A few bore holes are shown on Plate 7-1, but only one (LMC-4) of the bore holes used to construct these cross sections is shown on that map, and none are shown on Plate 6-1. Locations of the bore-holes and measured sections used to construct these cross sections need to be shown accurately on Plate 6-1 or 7-1 or other suitable map.

No new chemical analyses for acid- or toxic-forming or alkalinity-producing materials have been submitted with the significant revision. Coal quality and acid- and toxic-forming potential of coal, roof, and floor samples from the Hiawatha Seam are summarized in Tables 6-5 and 6-6 in the current MRP. Samples were from bore holes LMC-4 and HZ-95-1, HZ-92-2, and HZ-95-3. Copies of analyses reports for samples from LMC-4, for both the Hiawatha and Castlegate "A" Seams, are in Appendix 6-2. Coal analysis reports in Appendix 6-2 include total sulfur and pyritic sulfur. One sample was analyzed for the Castlegate "A" Seam and one for the Hiawatha Seam. Optical differentiation between marcasite and pyrite was done for the two coal samples: the samples were 0.04 percent pyritic sulfur, of which marcasite accounts for 0.001 to 0.002 percent.

Appendix 6-2 includes proximate analyses, including total sulfur, that were reported by Doelling in his 1972 Monograph on the Central Utah Coal Fields for five coal samples from the McGowen Sean in the Blue Blaze No. 3 Mine.

Information on thickness and engineering properties of clays or soft rock in the stratum immediately above and below each coal seam to be mined is on page 6-17 of the current MRP. This information was obtained from the LMC drill holes and certain of the GCD series of holes drilled by

Beaver Creek Coal Company. The locations of the Beaver Creek Coal Company holes are supposed to be on Plate 3-3 (page 6-17) but there are no bore holes indicated on Plate 3-3, neither in the current MRP nor in the significant revision.

The Division has not required the collection, analysis, and description of additional geologic information, nor has the Division determined such additional geologic information necessary to protect the hydrologic balance, to minimize or prevent subsidence, or to meet the performance standards.

The permittee has not requested that the Division waive in whole or in part the requirements of the borehole information or analysis required of this section.

#### **Findings:**

**R645-301-622.100**, Locations of the Beaver Creek Coal Company drill holes, which were used to determine the properties of the roof and floor rock, are supposed to be on Plate 3-3 (page 6-17) but there are no bore holes indicated on Plate 3-3, neither in the current MRP nor in the significant revision.

**R645-301-622.100**, Approximate locations of the bore-holes and measured sections used to make geologic cross sections (Plates 6-2 and 6-3) in the current MRP are shown on small index maps and tabulated in Tables 6-3 and 6-4. The relationship of these cross sections to the proposed revised permit area is not clear. A few bore holes are shown on Plate 7-1, but only one (LMC-4) of the bore holes used to construct these cross sections is shown on that map, and none are shown on Plate 6-1. Locations of the bore-holes and measured sections used to construct these cross sections need to be shown accurately on Plate 6-1 or 7-1 or other suitable map.

## **MAPS, PLANS, AND CROSS SECTIONS OF RESOURCE INFORMATION**

#### **Analysis:**

##### **Coal Resource and Geologic Information Maps**

Plate 6-1 has been revised to show the proposed boundary. Other than that change, there has been no addition or change to Plate 6-1.

Additional information on lithologic characteristics for the permit and adjacent areas is shown on geologic cross sections on Plates 6-2 and 6-3 in the current MRP. Approximate locations of the bore-holes and measured sections used to make these cross sections are shown on small index maps and tabulated in Tables 6-3 and 6-4. The relationship of these cross sections to the proposed revised permit area is not clear. A few bore holes are shown on Plate 7-1, but only one (LMC-4) of the bore holes used

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### **Mine Workings Maps**

Old mine workings are shown on Plates 3-9 and 3-10. Projected mine workings are on Plate 3-3.

### **Well Maps**

There are no oil or gas wells in the proposed permit or adjacent areas.

### **Findings:**

Coal Resource and Geologic Information, Mine Workings, and Well Maps for Resource Information are adequate to meet the requirements of this section.

## **RECLAMATION PLAN**

### **MINE OPENINGS**

#### **Analysis:**

No new mine openings are proposed under the significant revision. Closure and reclamation of mine openings is discussed in Section 3.5.3.1 (page 3-31).

#### **Findings:**

Mine Openings information for the Reclamation Plan is adequate to meet the requirements of this section.